

Hazard Analysis of Transmission Pipelines Carrying Hydrogen Gas

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Hydrogen is considered to be the most important future energy carrier in many applications reducing significantly greenhouse gas emissions, but the safety issues associated with hydrogen applications need to be investigated and fully understood to be applicable as the carrier. Generally, the locations of hydrogen production and consumption are different place. Pipeline delivery is cheaper than all other methods for large quantities of hydrogen. The rupture of a hydrogen pipeline can lead to outcomes that can pose a significant threat to people and property in the immediate vicinity of the failure point. In this work, a simplified equation of hazard analysis is proposed for the pipeline transporting hydrogen, which relates the diameter, the operating pressure and the length of the pipeline to the size of the affected area in the event of a failure of the pipeline. The dominant hazards are thermal radiation from sustained fire and sock pressure from unconfined gas cloud explosion. For a transmission pipeline of hydrogen gas, hazard area from the fire is slightly lager than the other event. The hazard area is directly proportional to the operating pressure raised to a half power, and to the pipeline diameter.